

SERVICE MANUAL

TDP490

In Touch with Tomorrow
TOSHIBA

1.0 GENERAL INFORMATION

- 1.1 Overview
- 1.2.1 System Specifications TDP490
- 1.3 Connection and block diagram
- 1.4 Fan operation and voltages
- 1.5 SUP — Software Upgrade Package

2.0 TROUBLESHOOTING

- IP 0 Problem isolation
- IP 1 Startup problems
- IP 2 Lamp problems
- IP 3 Image problems computer/
video or both
- IP 3-2 Image problems continued

3.0 PARTLIST

- 3.1 Cabinet and exterior parts
- 3.2 Lamp / lamp related parts
- 3.3 Electronics, PCBs and internal parts
- 3.4 Fans
- 3.5 Internal cables, flex cables
- 3.6 Accessories

4.0 REMOVAL AND REPLACEMENT

- RR 1.1 Cabinet, top
- RR 1.2 Cabinet, bottom
- RR 1.3 Connector plate
- RR 2.1 Lamp replacement
- RR 3.1 Front end powersupply
- RR 3.2 Main board
- RR 3.3 Formatter board
- RR 3.4 Video extension board
- RR 3.5 Analog board
- RR 3.6 Lamp driver board
- RR 3.7 Touch panel
- RR 4.1 Zeiss unit
- RR 4.2 Fan, large right
- RR 4.3 Fan, small right
- RR 4.4 Fan, small left
- RR 4.5 Loudspeaker

I GENERAL INFORMATION

I.1 OVERVIEW

How to use this manual

The purpose for the manual is to provide information useful for servicing the TDP490

Our intention is to divide the manual into five chapters. You find a description of each chapter below:

Chapter 1. General Data

This chapter contains a product overview, information on manual usage and system specifications.

Chapter 2. Part List

This chapter provides exploded view drawings of field spare parts that are indexed to the item number and description on the spare part lists

Chapter 3. Troubleshooting

This chapter provides an introduction to the basic troubleshooting method and Isolation Procedures.

The procedures are presented in flowchart format.

Chapter 4. Removal and Replacement

This chapter contains Removal & Replacement procedures which gives a description on how to remove and replace different parts and modules in the product.

1.2.1 SYSTEM SPECIFICATIONS TDP490

This section contains the system specifications, system dimensions, space requirements and electrical requirements for the TDP490 Service Manual.

Physical Specifications

Weight	4.5 kg / 9.9 lbs
Dimensions	W: 335mm D: 225mm H: 130mm
Operating temperature	10°C - 40°C

Electrical Specifications

Voltage	100-250 VAC, full range power supply.
Frequency	50-60 Hz.
Power consumption:	180 W typical, 200W max.

Technical Specifications

Brightness	450 ANSI lumens typical
Resolution	800 pixels x 600 pixels (SVGA)
Contrast Ratio	500:1 ANSI full ON/OFF / 230:1 ANSI Checkerboard
Uniformity	85% image center to corner
Colour	24 bit, 16.7 million colours.
Focal range	1.75 m — 5 m.
Noise Level	Not available
Audio	1 x 10 W RMS
Horizontal frequency	15 kHz — 60 kHz
Vertical frequency	48 Hz — 85 Hz
Projection lamp	120 W Metal Halide UHP — Ultra high performance.
Lamp Lifetime	2000 hrs. typical

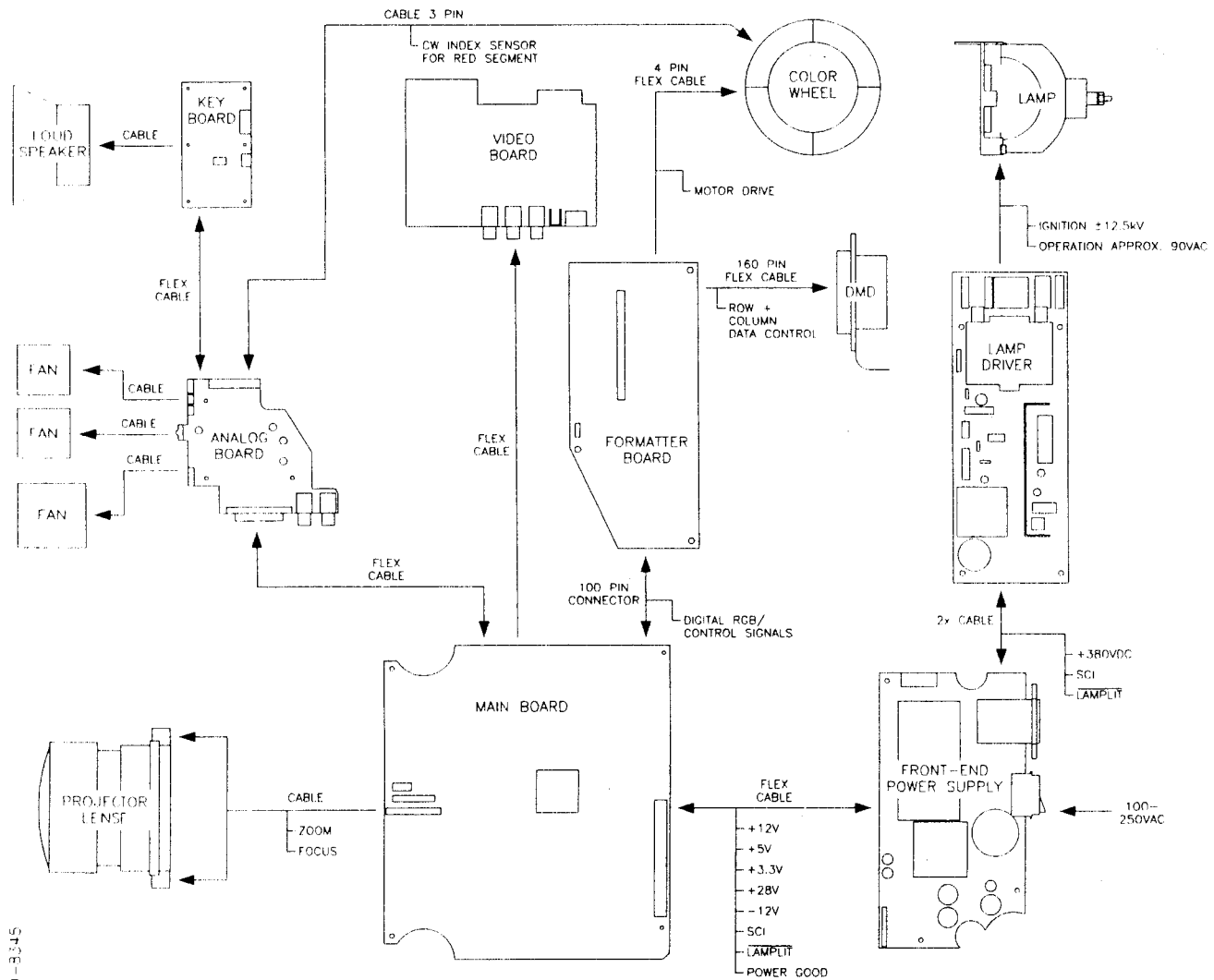
- Specifications updated as of July 15, 1998 -
- Specifications subject to change without notice -

I GENERAL INFORMATION

I.3 ELECTRICAL CONNECTIONS AND BLOCK DIAGRAM.

In the following diagram, all boards and connections are described. Cables and flex cables are marked with arrows, indicating signal direction.

On connections where this is important, voltage values are stated.



I.4 FAN FUNCTIONING AND VOLTAGES.

There are three fans in the TDP490. two input fans and one exit fan.

The two right fans are for input airflow, and creates an overpressure in the cabinet, protecting it from dust. The left fan is an exit fan, and removes preheated air surrounding the lamp.

All fans are temperature regulated, and is controlled by an NTC resistor at the center corner of the analog board.

The fans are calibrated in accordance with room temperature, and have the same voltage supply. This voltage comes from the +12V. The big fan starts however somewhat slower than the others, due to differences in electrical characteristics.

When the unit is in standby, the fans are supplied with 4,5V, and only the two small fans are moving. In operation, the voltage varies from 4,5 — 12V, depending on temperature.

At 20°C, the voltage is stabilised at 8-10V.

At 40°C, the voltage reaches its maximum level at approx. 12V.

If fans are not operating, this indicates a loss of +12V, and flex cables between main board and analog board, and between main board and front-end power supply should be checked.

I GENERAL INFORMATION

I.5 SUP - SOFTWARE UPGRADE PACKAGE.

INTRODUCTION

This manual describes how to upload a new program version on projectors having the software upgrade feature.

PROGRAM VERSION

Follow the procedure below to find out which program version that is currently installed in your projector.

- 1) Access the information window from the main menu. (Refer to section "Product information" in the projector's user manual).
- 2) Locate the "program version"-text in the information window. Figure 1 shows the interpretation of the program version. The program version will be updated after the software upgrade process described in this document is completed.

B / LV2 / A / 309

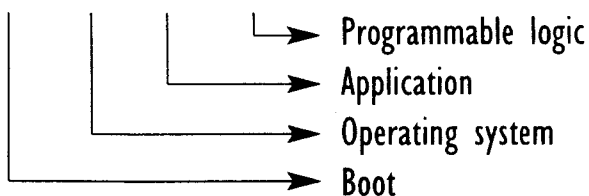


Figure 1: Breakdown of the program version code.

UPLOADING NEW PROJECTOR SOFTWARE

Equipment Required

To upgrade the software in your projector the following equipment is needed:

- PC running Windows NT4.0 or Windows 95.
- Floppy disk labeled "Software Upgrade Package — SUP". The disk must contain the files SUP.EXE and README.TXT.
- The new software version file that is to be uploaded to the projector. The file may be stored on a floppy disk or on the hard disk and must have a file extension ".BIN".
- Programming cable
- EVC cable
- PC adapter — passive (without monitor connector) or active (with monitor connector).

INSTALLING THE SUP PROGRAM

- 1) Turn on the PC and create a new directory for the Software Upgrade Package. The directory can for example be named C:\UPGRADE.
- 2) Insert the floppy disk labeled "Software Upgrade Package — SUP" into the PC's floppy disk drive.
- 3) Copy the two files SUP.EXE and README.TXT from the floppy disk to the newly created directory C:\UPGRADE.

PROCEDURE FOR UPGRADING

- 1) Connect the projector to the PC as shown in Figure 2 and switch on both devices. The setup is identical to the normal setup used when projecting images except for the programming cable from the PC-adaptor to the PC. This should be connected to serial port 1 (COM1) on the PC. (Note: If another port is used, e.g. COM2, this replaces the text "COM1" for the rest of this document).

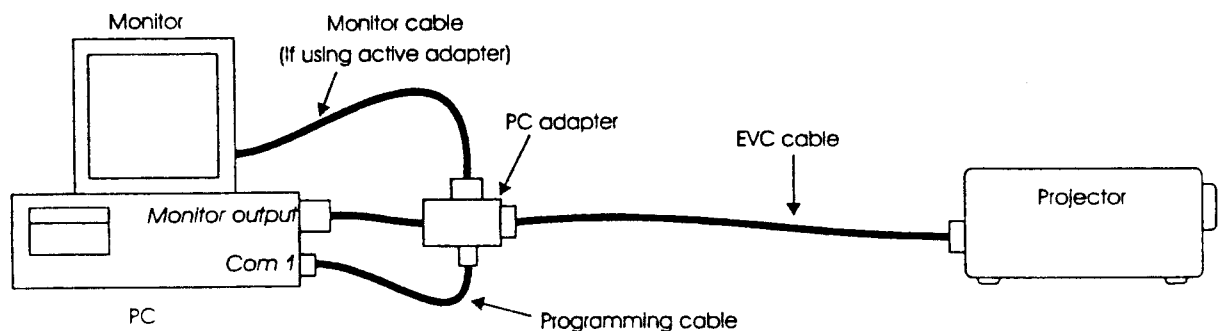


Figure 2: Connecting the PC to the projector for upgrading.

- 2) Start the SUP program. This can for example be done by selecting **Run** in the Windows Start menu and then pressing the **Browse...**-button. Double click the directory C:\UPGRADE. Then double click the SUP.EXE icon. This will start the SUP program and the window in Figure 3 will appear on the screen.

I GENERAL INFORMATION

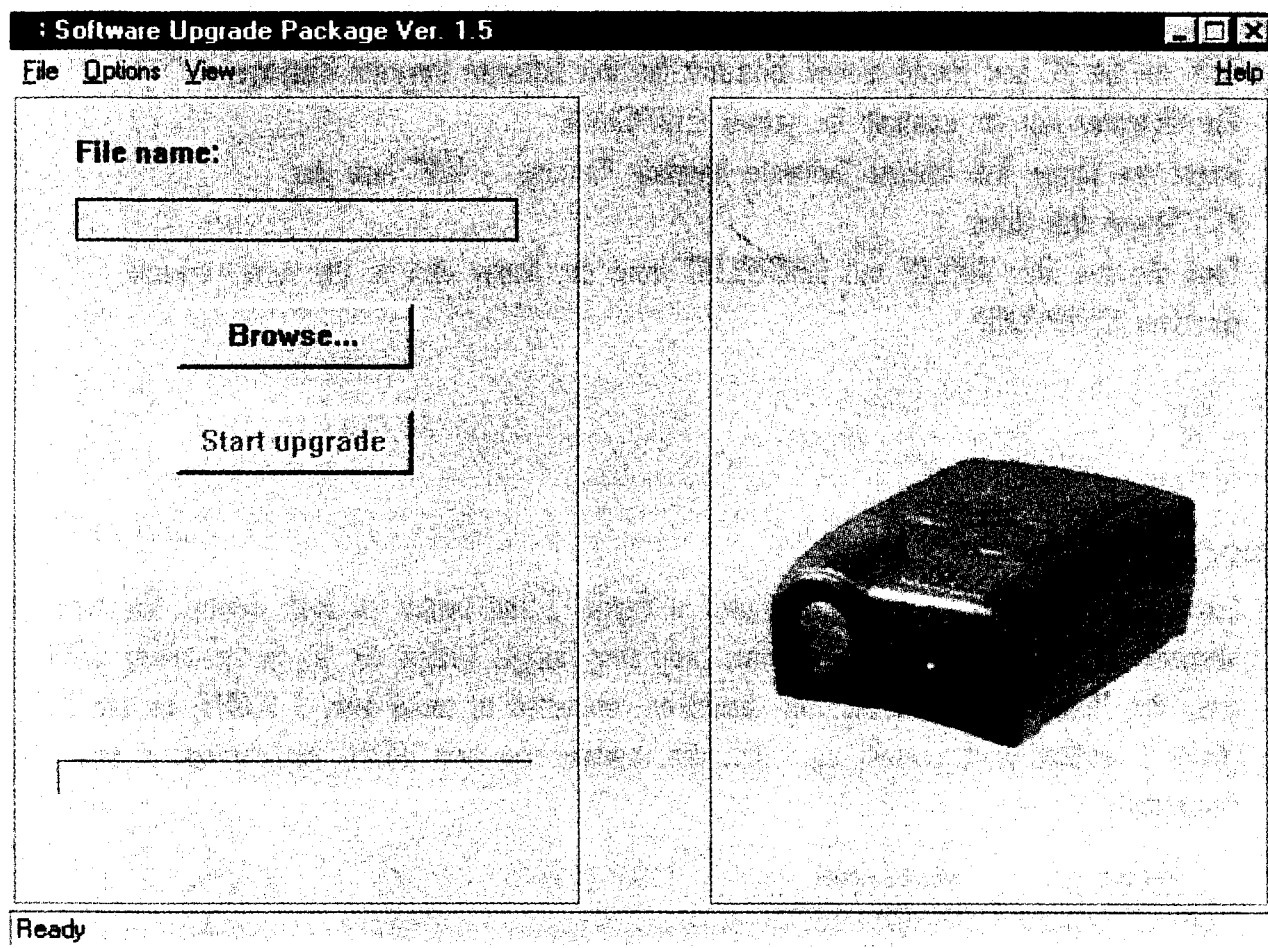


Figure 3: SUP initial view.

- 3) Press the **Browse...**-button in the SUP window. Select the file to be uploaded to the projector and press **Open** (Figure 4). In this example the file is named "B_LV2_A_309.BIN".

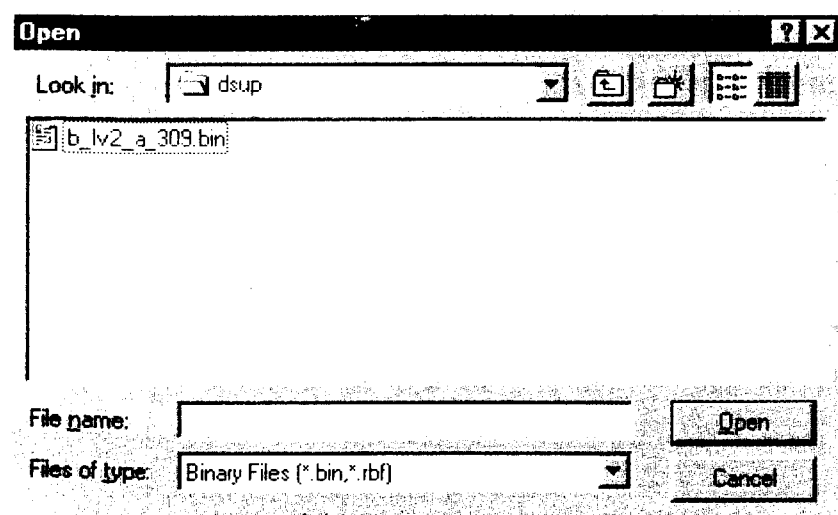


Figure 4: Selecting software version file to be uploaded to the projector.

- 4) Press the **Start upgrade**-button. The text "Erasing old software, please wait" will appear in the status bar as shown in Figure 5. Note that erasing can last up to two minutes.

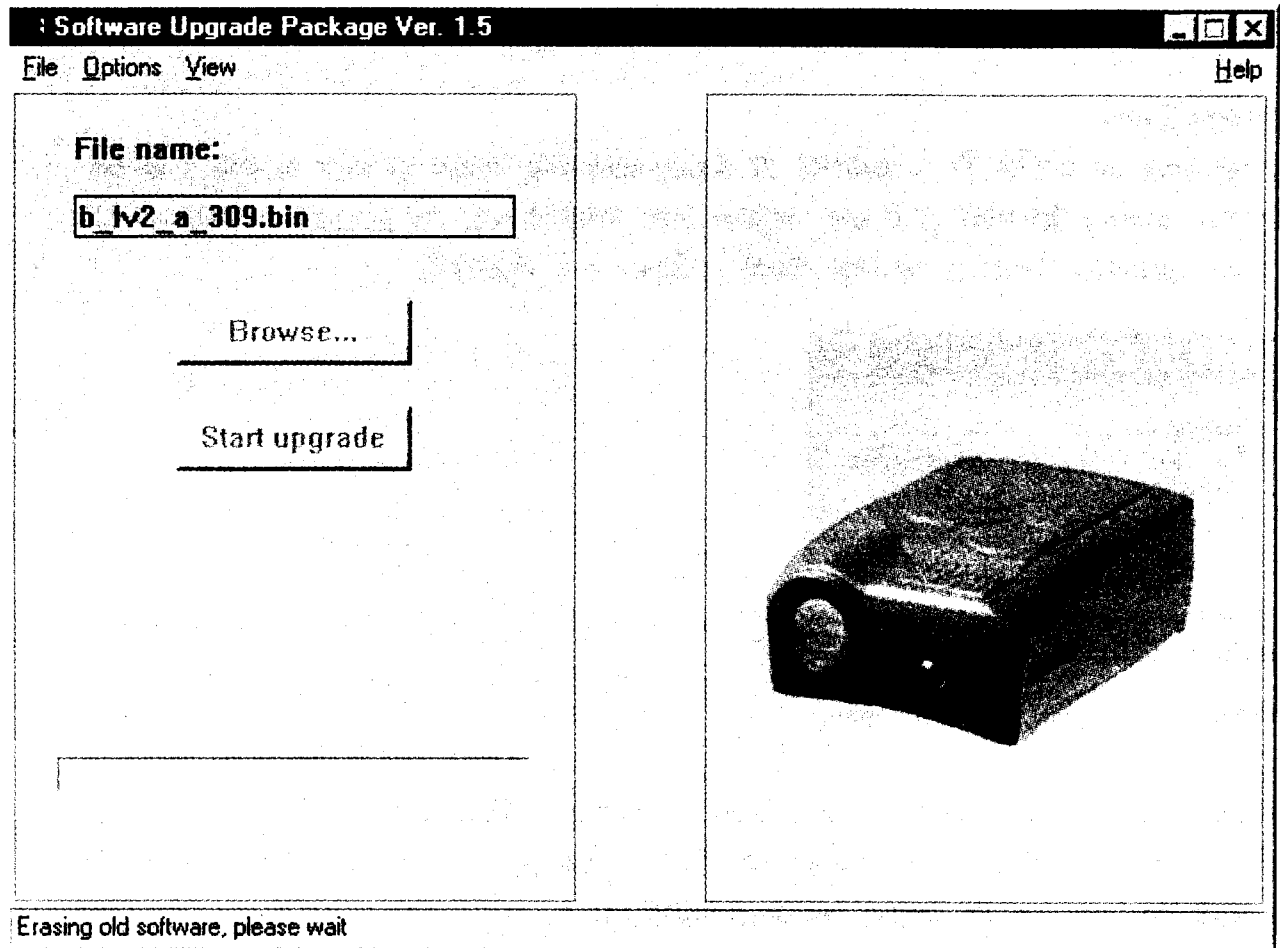


Figure 5: Upgrade process just started. Erasing old software.

- 5) When erasing finishes, the new software will be transferred to the projector. The status bar shows the percentage uploaded. This information will also be shown graphically above the status bar.
- 6) The message window in Figure 6 completes the transfer.

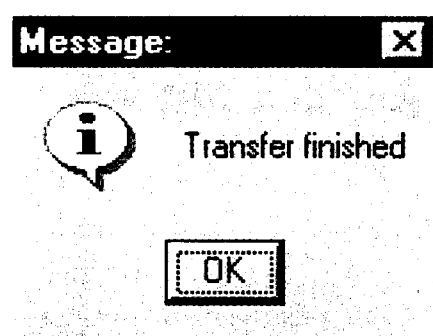


Figure 6: Transfer completed successfully.

- 7) Turn off the projector. The new software will now run the next time the projector is switched on.

I GENERAL INFORMATION

ERRORS DURING TRANSFER

Power Loss

If the projector and/or PC is switched off during uploading, simply go back to step 1 of the upgrade process described in 0 and continue from there. If only the projector is switched off during uploading the error message shown in Figure 7 is displayed.

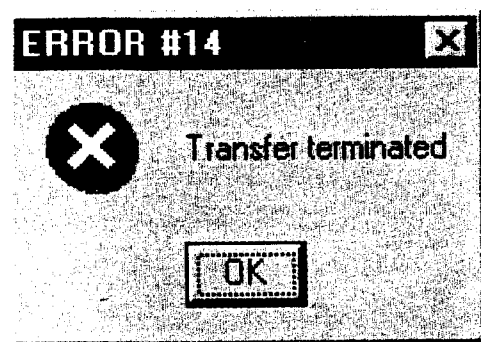


Figure 7: Transfer error message.

Note: The projector expects to be uploaded with new software the next time it is switched on after an unexpected power loss during uploading. In this case the projector's lamp will not be lit and all the lights on the keypad will be switched on.

Timeout Error

If erasing old software (step 4, section 0) ends with the error message shown in Figure 7 this is due to a timeout error. In this case the following actions should be taken:

- Make sure the procedure for upgrading described in section 0 is followed. Pay particular attention to the setup shown in Figure 2.
- Check which serial port (COM-port) on your PC the programming cable from the PC-adaptor is connected to. Verify that the SUP program is set up to use this serial port by checking the **Options** menu. Also make sure the baud rate for this serial port is set to 38400 in the **Options->Settings** menu.

CHAPTER 2 TROUBLESHOOTING**OVERVIEW**

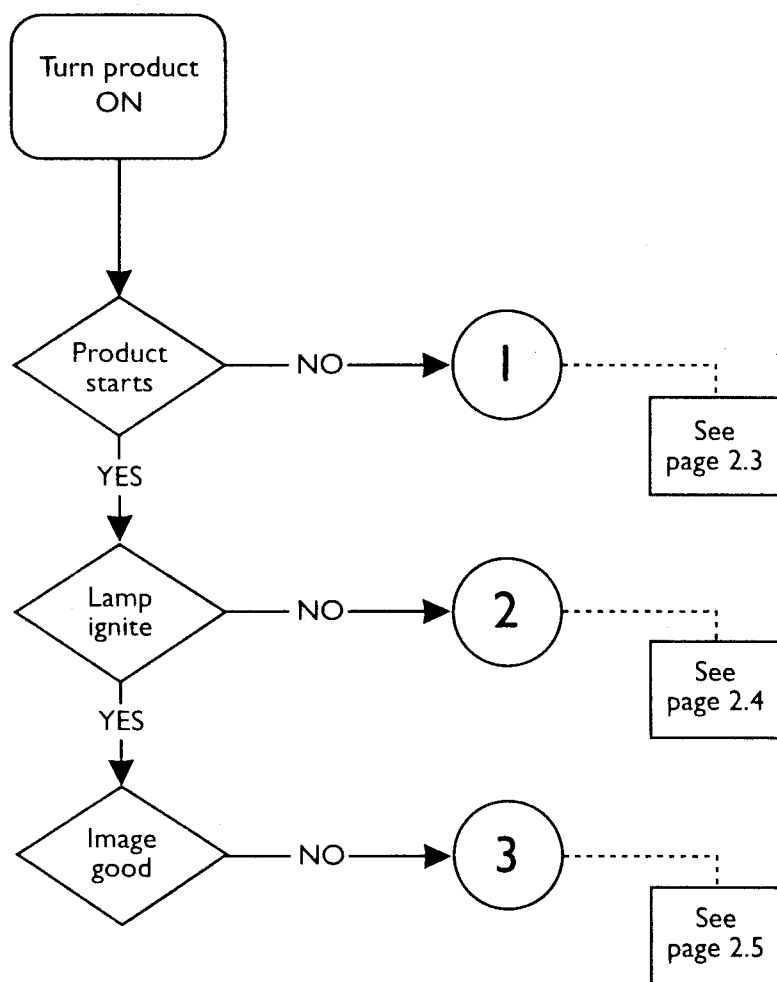
This chapter provides troubleshooting information in form of flow -charts.

TABLE OF CONTENTS

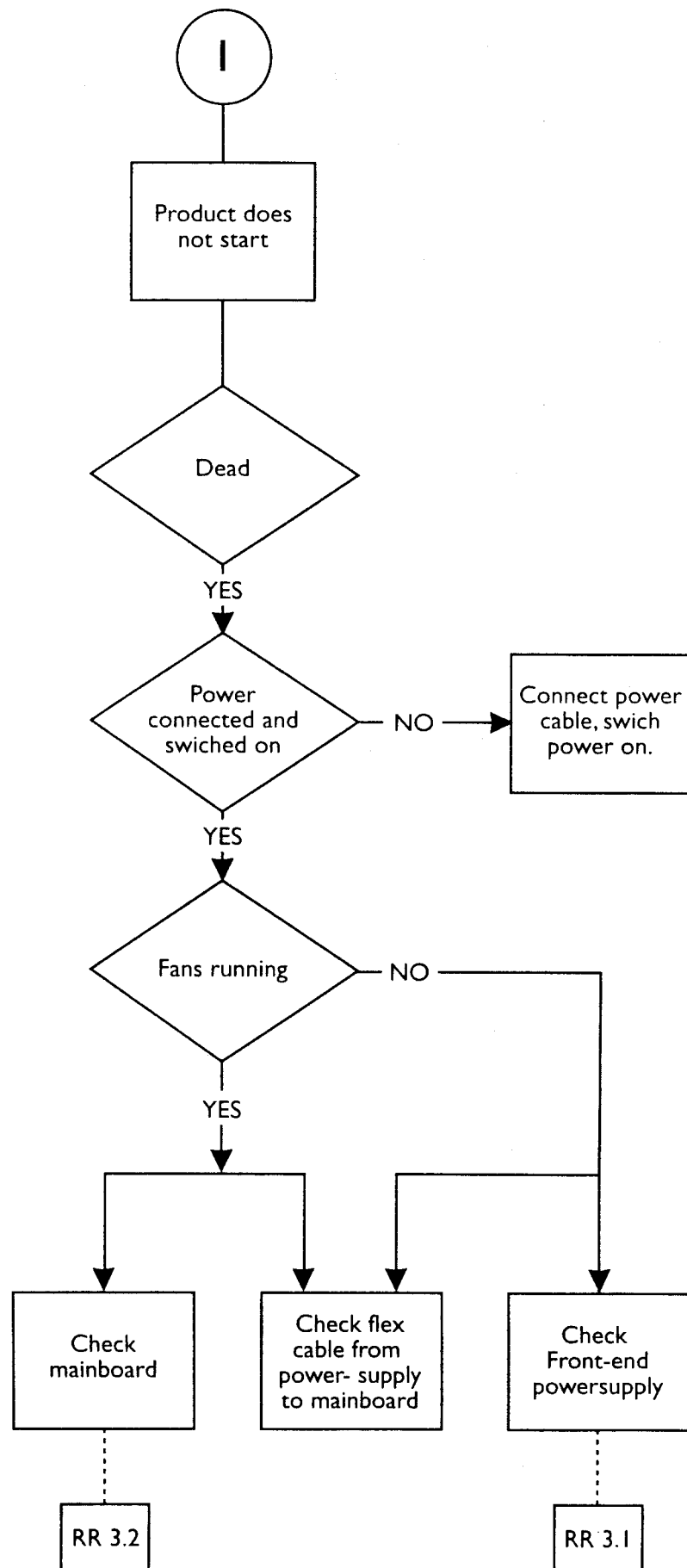
IP 0	Problem isolation	2 - 2
IP 1	Startup problems	2 - 3
IP 2	Lamp problems	2 - 4
IP 3	Image problems computer / video or both	2 - 5
IP 3-2	Image problems continued	2 - 6

2 TROUBLESHOOTING

IP 0: PROBLEM ISOLATION

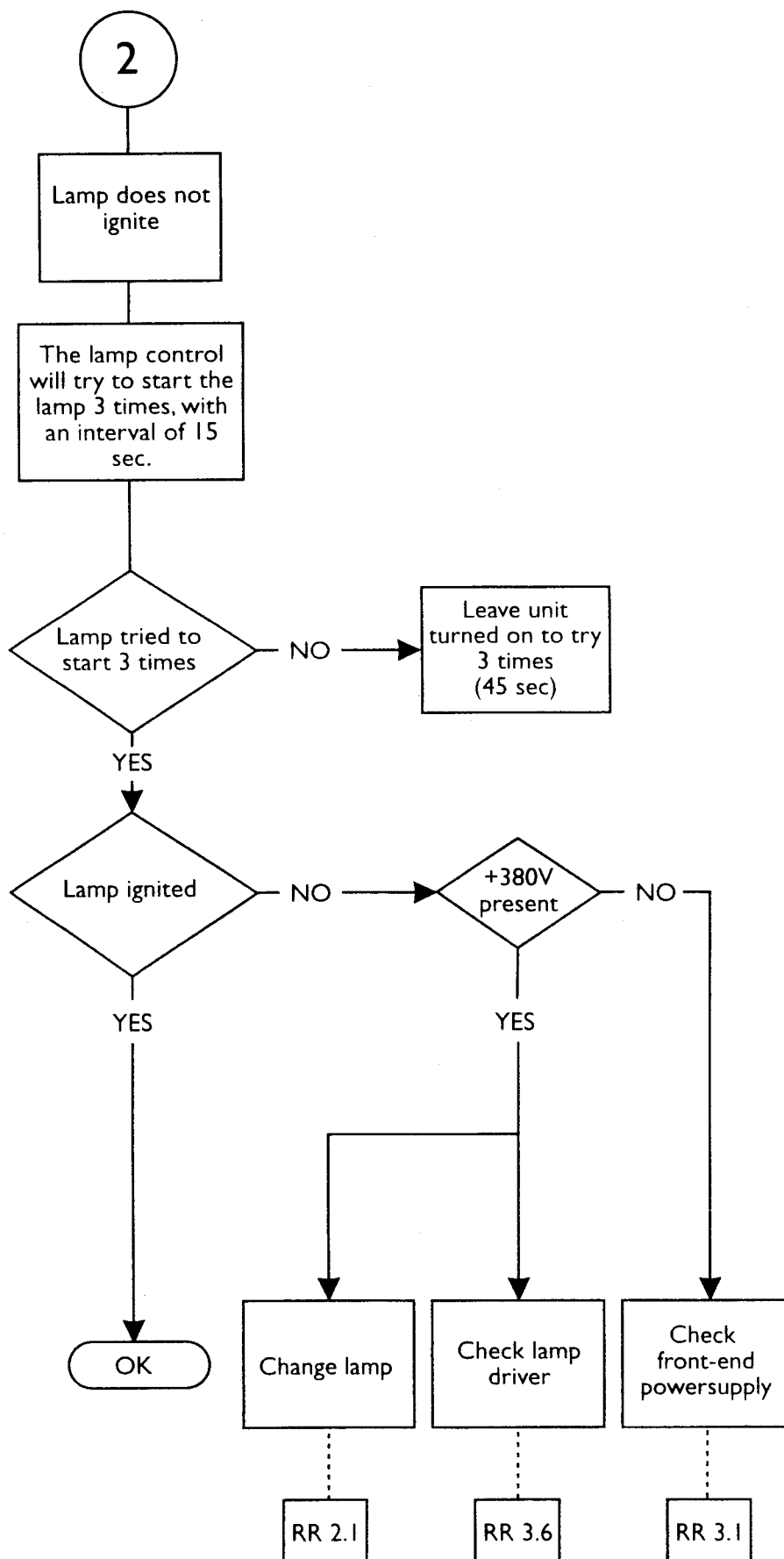


IP 1: STARTUP PROBLEMS

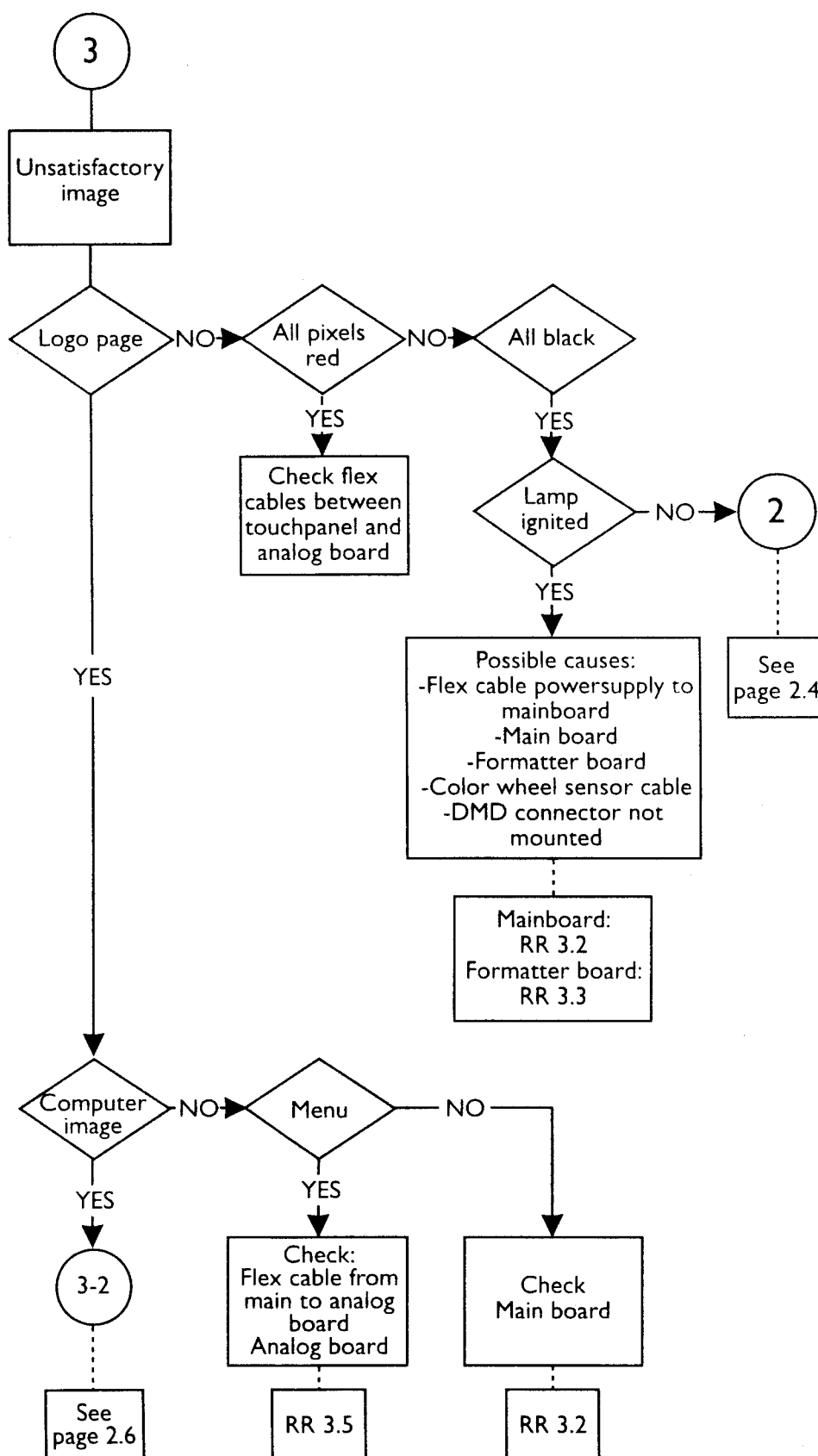


2 TROUBLESHOOTING

IP 2: LAMP PROBLEMS

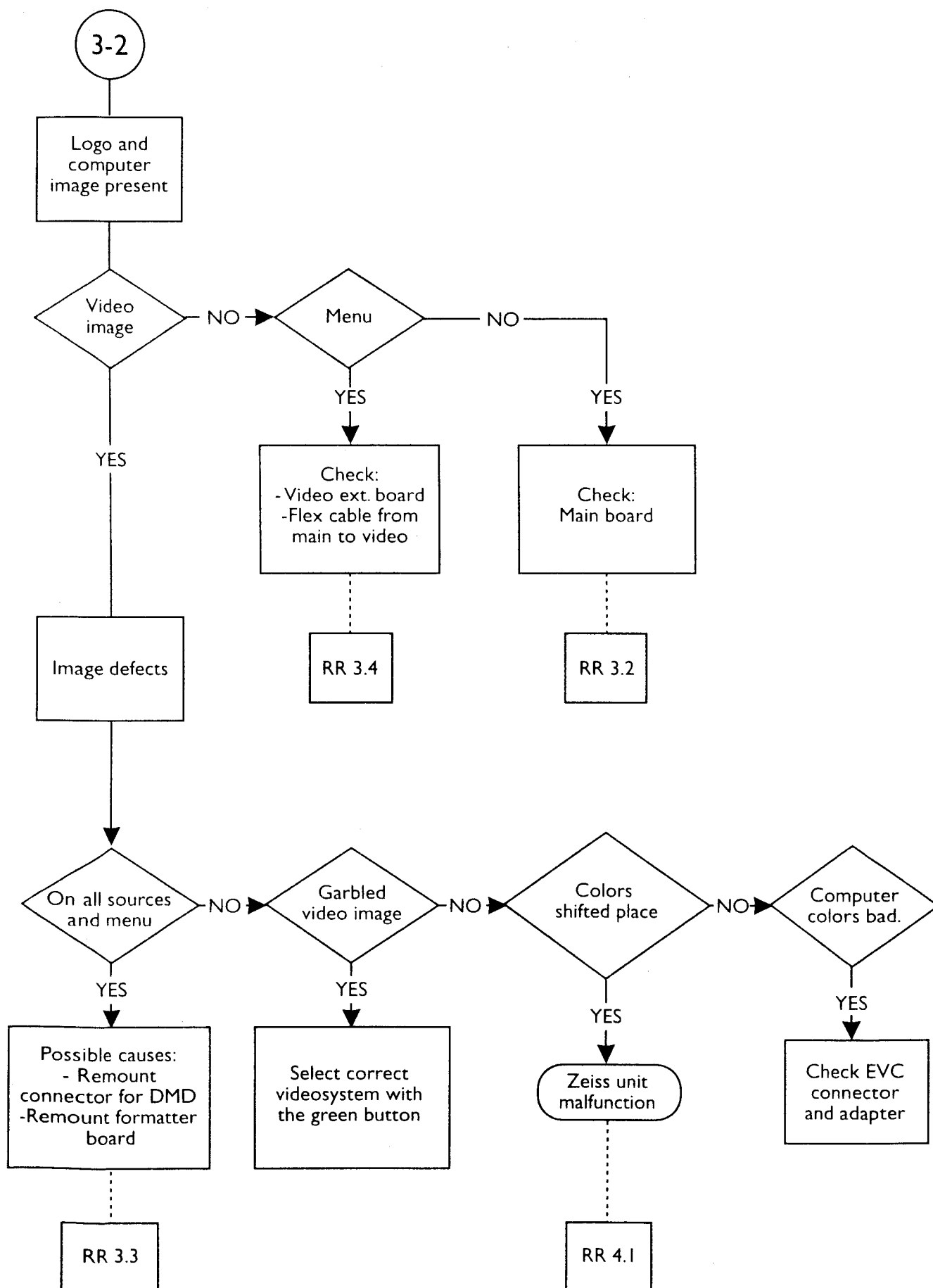


IP 3: IMAGE PROBLEMS



2 TROUBLESHOOTING

IP 3-2: IMAGE PROBLEMS CONTINUED



CHAPTER 3 PART LIST

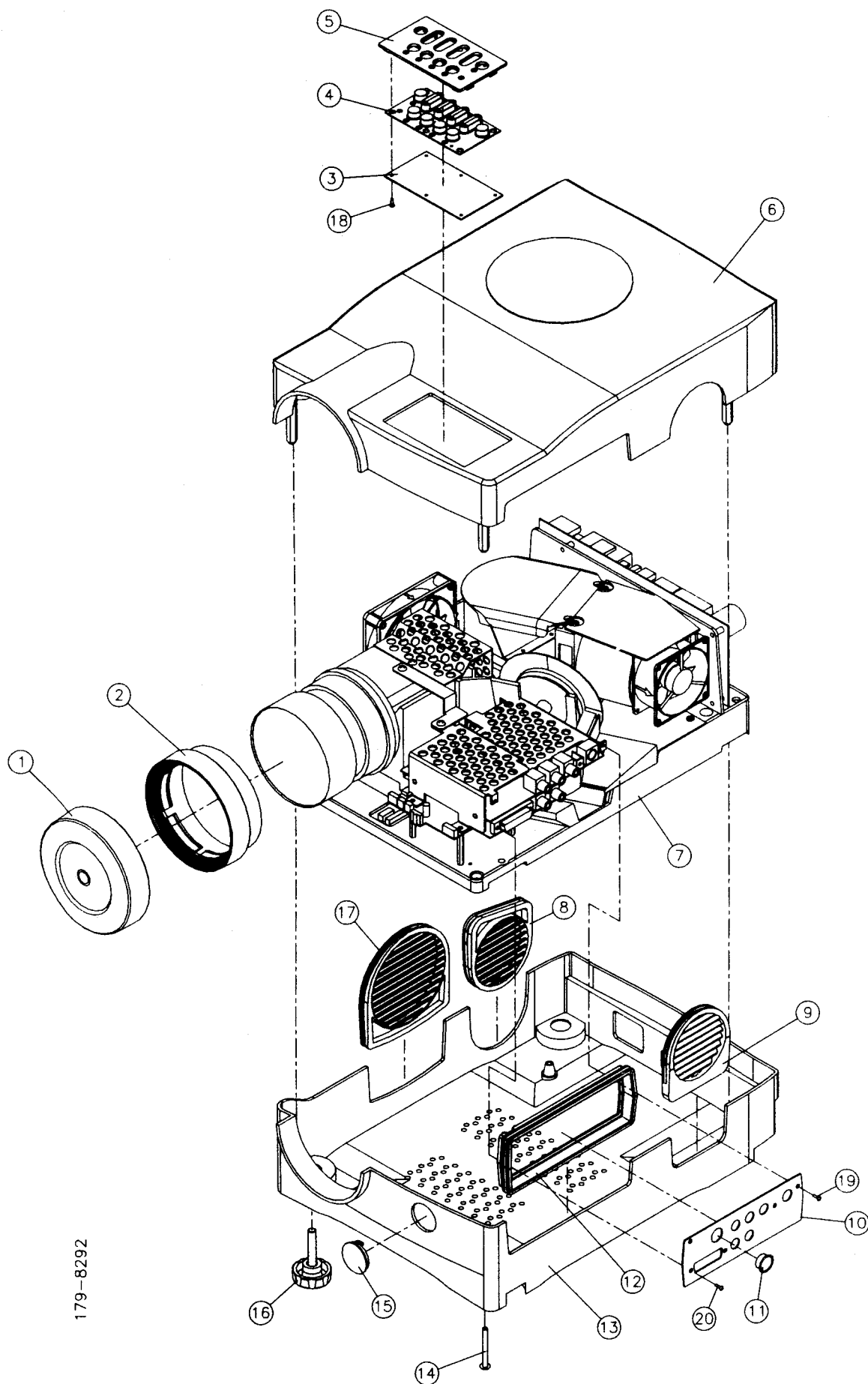
OVERVIEW

This chapter contains exploded views with reference to an indexed spare part list intended for field service.

TABLE OF CONTENTS

3.1	Cabinet and exterior parts	3 - 2
3.2	Lamp / lamp related parts	3 - 4
3.3	Electronics, PCBs and internal parts	3 - 6
3.4	Fans	3 - 8
3.5	Internal cables, flex cables	3 - 8
3.6	Accessories	3 - 10

3 PART LIST

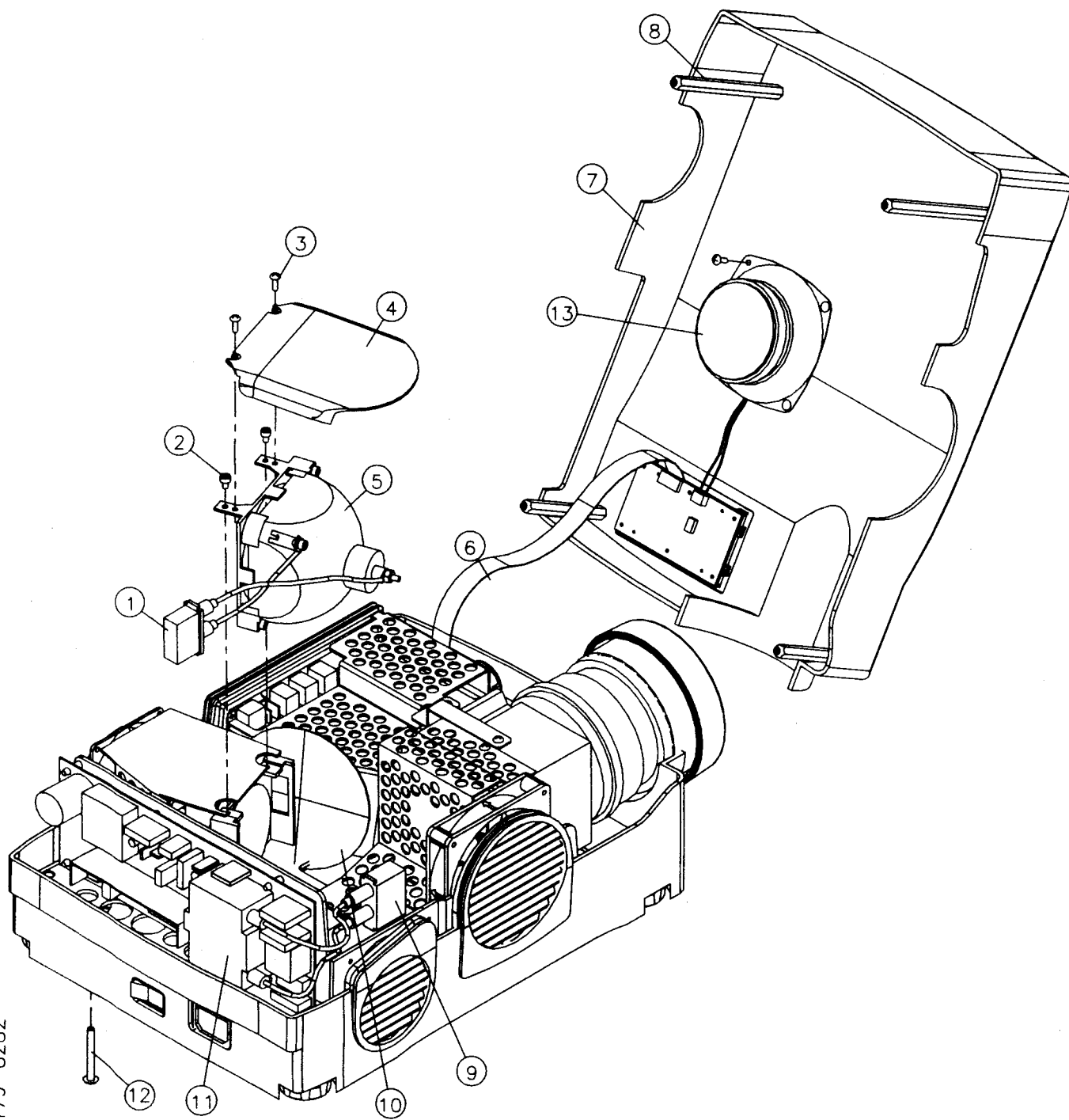


179-8292

3.1 CABINET AND EXTERIOR PARTS

Item #	Part#TDP490	Description
1	3040740	Protection for lens
2	3040730	Ring, zoom lens
3	5040630	Touchpanel PCB
4	3940310	Touchpanel silicone
5	3040720	Touchpanel cabinet
6	3040700	Cabinet, top - TOSHIBA
7	3142180	Bottom chassis
8	3040780	Airgrid, small right TOSHIBA
9	3040790	Airgrid, small left TOSHIBA
10	3142250	Connector plate, video/data/TV-tuner
11	3140840	Cover for TV tuner.
12	3040750	Frame for connectorplate
13	3040710	Cabinet, bottom - TOSHIBA
15	3440230	Cover, IR
16	3540240	Foot for TDP490
17	3040770	Airgrid, large right - TOSHIBA
18	N/A	Incl. In screw kit, p/n 5840180
19	N/A	Incl. In screw kit, p/n 5840180
20	N/A	Incl. In screw kit, p/n 5840180

3 PART LIST

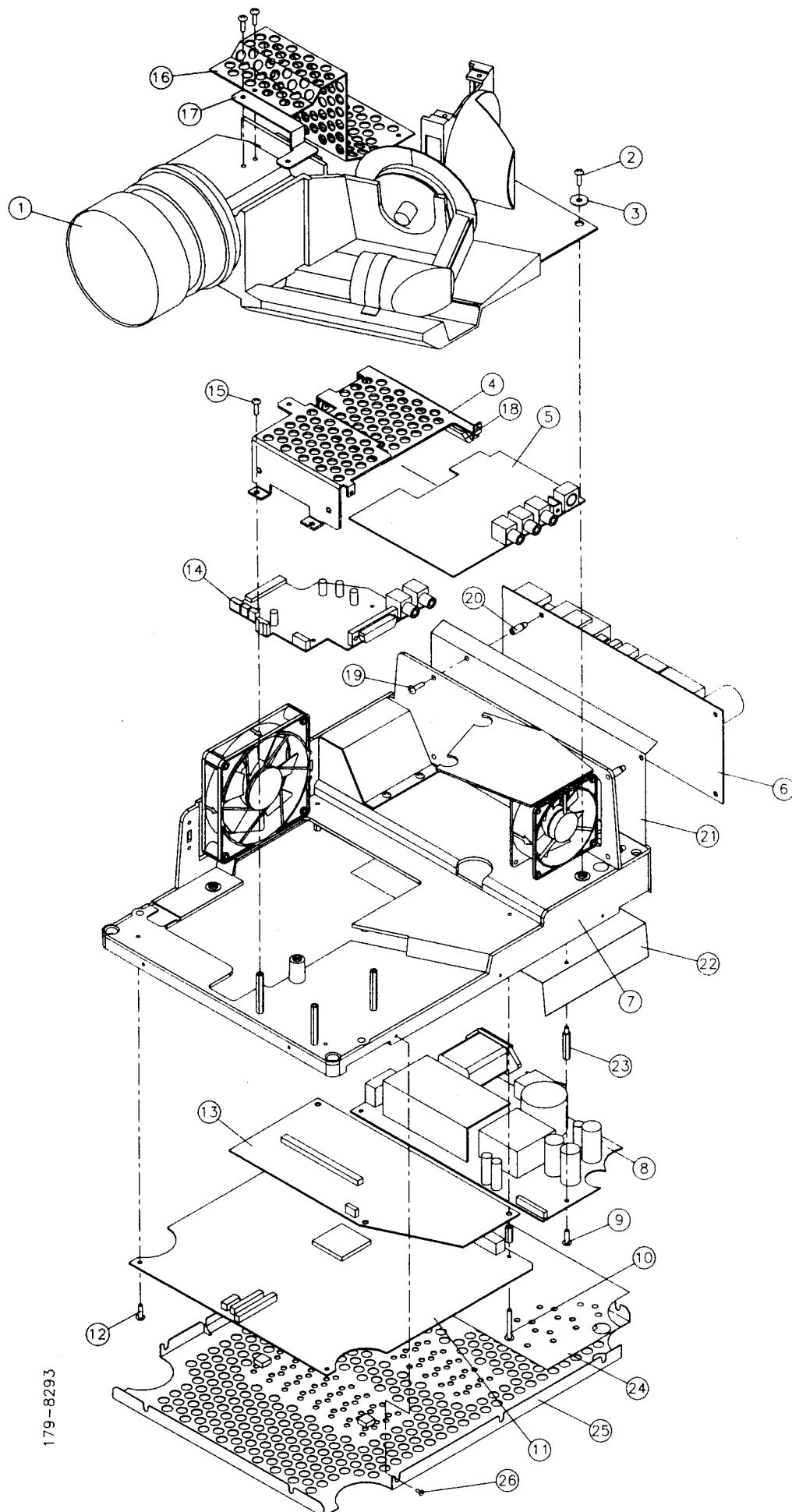


179-8282

3.2 LAMP / LAMP RELATED PARTS

Item #	Part#TDP490	Description
1	N/A	Connector, lamp, included in 2940420
2	N/A	Included in 2940420
3	N/A	Included in Screw Kit, p/n 5840180
4	3040390	Heat cover, lamp
5	2940420	Lamp replacement kit
6	5240691	Flex cable analog-touchpanel
7	3040700	Cabinet, top - TOSHIBA
8	3341870	Spacer, L=97,4mm (back)
8	3341880	Spacer, L=71,9mm (front)
9	N/A	Connector, lamp driver, included in 5040620
10	N/A	Colour wheel, included in Zeiss optical engine
11	5040620	Lamp driver PCB
12	N/A	Included in Screw Kit, p/n 5840180
13	2740060	Loudspeaker

3 PART LIST

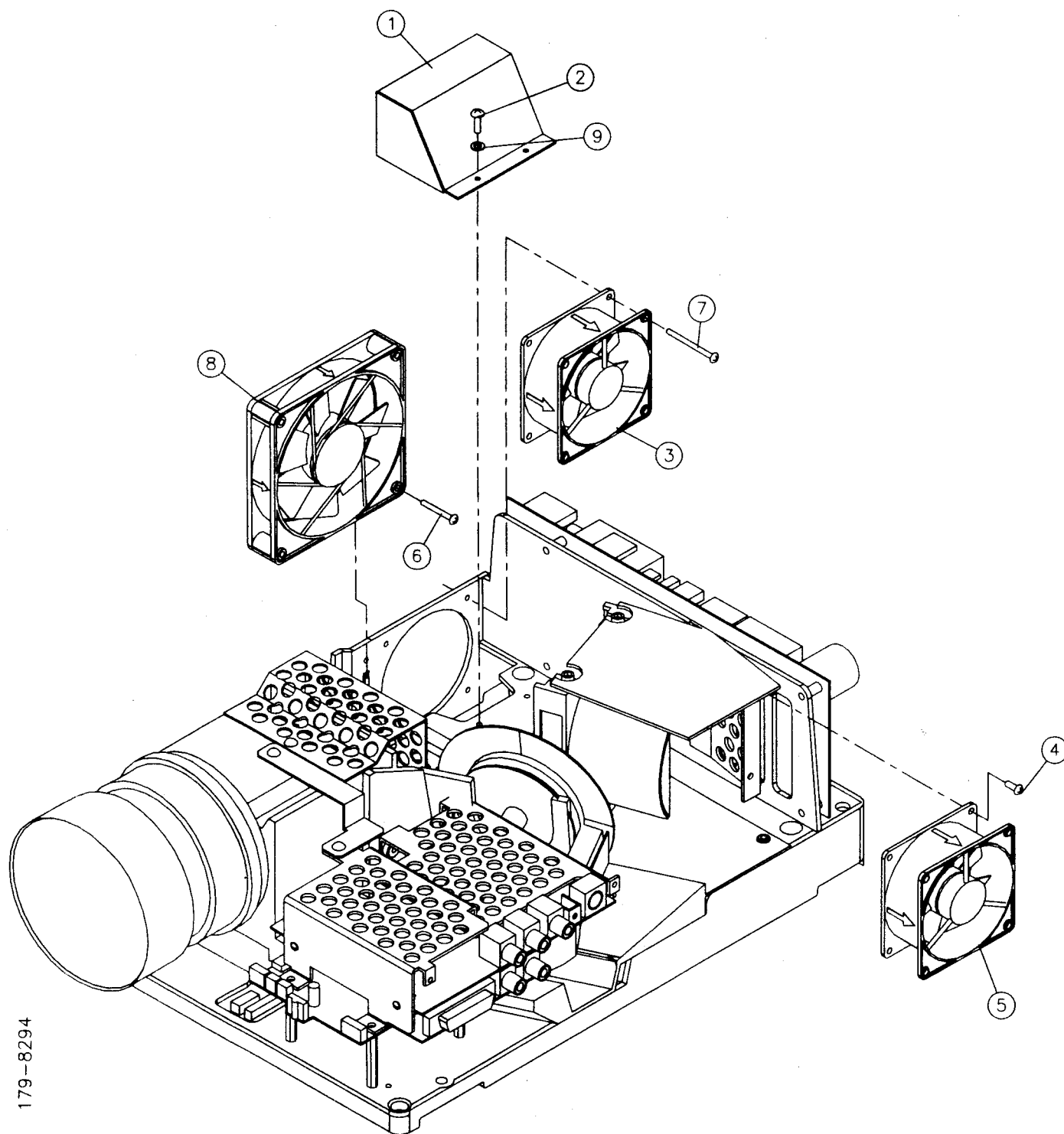


179-8293

3.3 ELECTRONICS, PCBS AND INTERNAL PARTS

Item #	Part#TDP490	Description
1	5940240	Zeiss optical engine
2	N/A	Incl. In screw kit, p/n 5840180
3	N/A	Incl. In screw kit, p/n 5840180
4	3142190	Bracket, video / TV-tuner
5	5040690	Video board without TV-tuner EURO / US
5,2	5040590	Video board with TV-tuner EURO
5,3	5040680	Video board with TV-tuner US
6	5040620	Lamp driver PCB
7	3142180	Chassis, bottom
8	5040560	Front end power supply PCB
9	N/A	Incl. In screw kit, p/n 5840180
10	N/A	Incl. In screw kit, p/n 5840180
11	5040572	Main PCB
12	N/A	Incl. In screw kit, p/n 5840180
13	5040600	Texas Instruments DMD formatter PCB
14	5040580	Analog PCB
15	N/A	Incl. In screw kit, p/n 5840180
16	3144520	Shield, DMD
17	3144590	Bracket
18	2940340	PCB rail guide
19	N/A	Incl. In screw kit, p/n 5840180
20	3341701	Spacer, nylon TCB5-6
21	2940350	Isolating board, lamp power supply.
22	2940400	Isolating board, front-end power supply.
23	2940400	Isolating board, front-end power supply.
24	2940360	Isolating board, EMC Chassis bottom
25	3144530	Shield EMC, Chassis bottom
19	N/A	Incl. In screw kit, p/n 5840180

3 PART LIST



179-8294

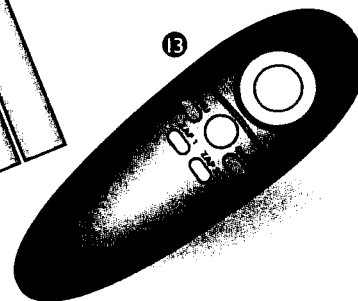
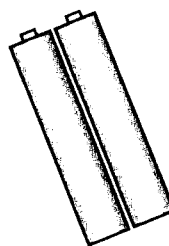
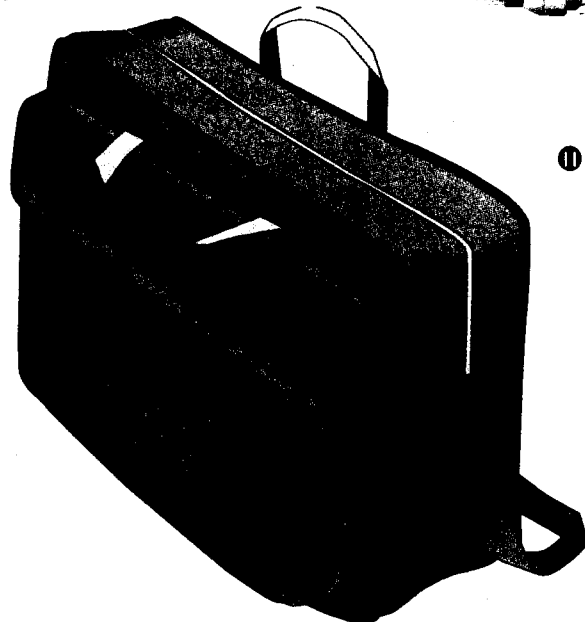
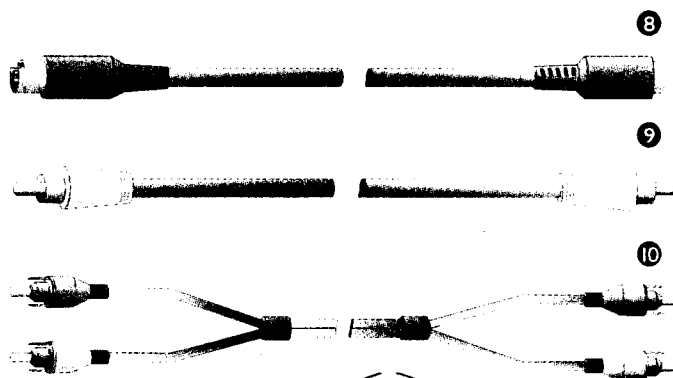
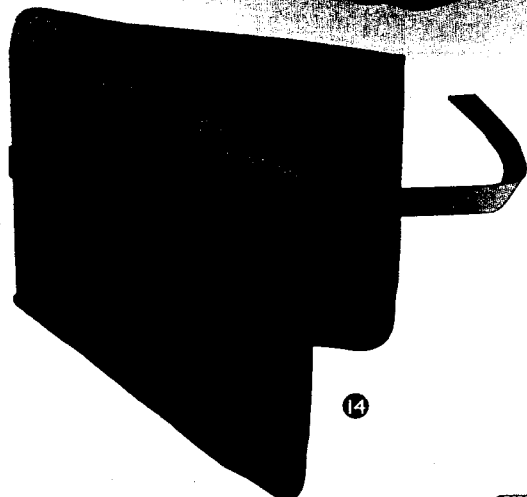
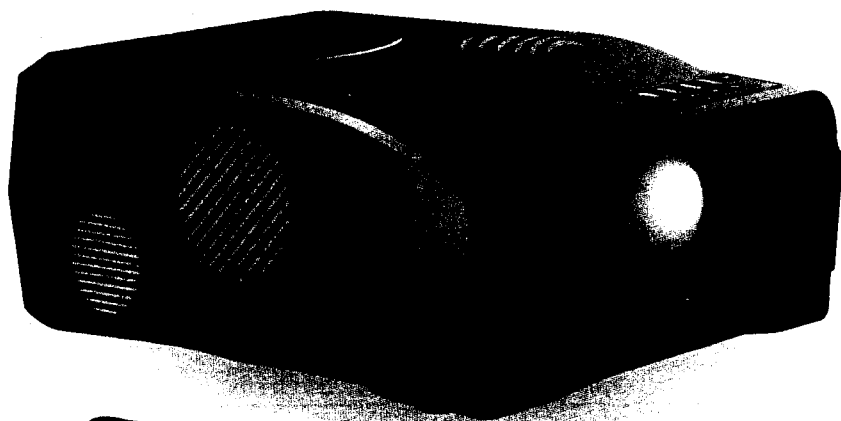
3.4 FANS

Item #	Part#TDP490	Description
1	3142610	Airgude, fan small right (fan II)
2	N/A	Incl. in screw kit, p/n 5840180
3	2540060	Fan, Sunon KD1206PKBI
4	N/A	Incl. in screw kit, p/n 5840180
5	5240820	Fan, Sunon KD1206PTBI
6	N/A	Incl. in screw kit, p/n 5840180
7	N/A	Incl. in screw kit, p/n 5840180
8	2540050	Fan, VPPV AD0812HB

3.5 INTERNAL CABLES, FLEX CABLES

Part#TDP490	Description
5240640	Cable, front-end power -> lamp driver
5240650	Cable, front-end power -> lamp driver
5240790	Cable, analog board -> fan for lamp
5240661	Flex cable 1, mainboard -> video ext. board
5240671	Flex cable 2, mainboard -> analogboard
5240681	Flex cable 3, front-end power -> mainboard
5240691	Flex cable 4, analogboard -> touchpanel PCB

3 PART LIST



3.6 ACCESSORIES

Item #	Part#TDP490	Description
1	8040120	EVC Cable standard, 3 mtr.
1	8040160	EVC Cable, 5 mtr.
1	8040300	EVC Cable, 10 mtr.
1	8040310	EVC Cable, 15 mtr.
2	8040150	Stereo jack cable
3	8140120	Active PC adapter
4	8040210	RS232 Mouse cable for PC
5	8040130	PS/2 Mouse cable for PC
6	8140130	Active MAC adapter
7	8040141	Mouse cable for MAC
8	8040170	S-Video cable
9	8040180	Composite video cable
10	8040190	Audio cable
11	8440060	Softbag
12	8040270	AC Cable, Euro ver.
12	8040280	AC Cable, UK ver.
12	8040290	AC Cable, US ver.
13	8240160	Remote control
14	8440070	Cable organizer bag

CHAPTER 4 REMOVAL & REPLACEMENT**OVERVIEW**

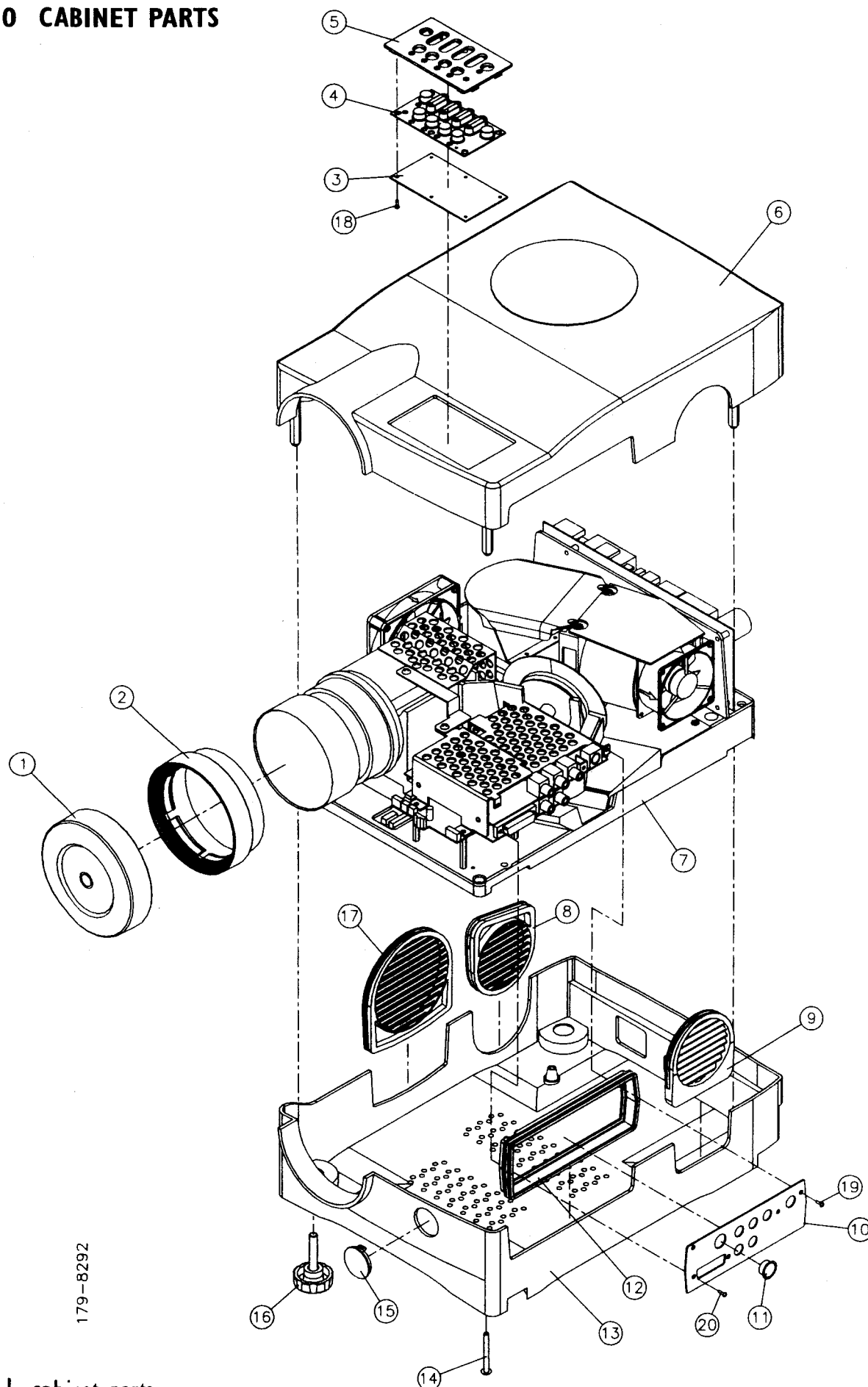
This chapter contains information how to remove and replace main components in the TDP490.

TABLE OF CONTENTS

RR 1.1	Cabinet, top	4 – 3
RR 1.2	Cabinet, bottom	4 – 3
RR 1.3	Connector plate	4 – 5
RR 2.1	Lamp replacement	4 – 5
RR 3.1	Front end powersupply	4 – 7
RR 3.2	Main board	4 – 8
RR 3.3	Formatter board	4 – 9
RR 3.4	Video extension board	4 – 10
RR 3.5	Analog board	4 – 11
RR 3.6	Lamp driver board	4 – 12
RR 3.7	Touch panel	4 – 12
RR 4.1	Zeiss unit	4 – 13
RR 4.2	Fan, large right	4 – 14
RR 4.3	Fan, small right	4 – 14
RR 4.4	Fan, small left	4 – 15
RR 4.5	Loudspeaker	4 – 15

4 REMOVAL & REPLACEMENT

1.0 CABINET PARTS



179-8292

fig.1, cabinet parts.

RR 1.1 CABINET, TOP

Removal

1. Zoom the lens, so that the lens ring has about 1 cm. clearance to the cabinet.
2. Turn unit off, and unplug the unit from powersupply.
3. Turn the unit upside down on a protective surface.
4. Unscrew the four screws. **(fig. 1 – pos. 14)**
5. Turn the unit back on the correct side.
6. Carefully lift the top cabinet up about 2 cm, then turning it over the front of the unit as shown in fig.2. Be careful not to break ribbon cable **(fig. 2 – pos. 6)** connecting the touch panel.
7. The cabinet may now be placed upside down facing the front of the projector, or the top cabinet can be disconnected by unsnapping the cable connector at the touch panel.

Replacement

1. Connect ribbon cable to touch panel, metal side of cable facing out, making sure the cable is correctly seated in the connector, and the plastic frame is pushed all the way in.
2. Make sure all air grids are in correct position. **(fig. 1 – pos. 8, 9, 17)**
3. Place top cabinet over the unit, notice lamp cable, making sure it is not caught between top and bottom cabinet.
4. Replace the four screws. **(fig. 1 – pos. 14)**

RR 1.2 CABINET, BOTTOM

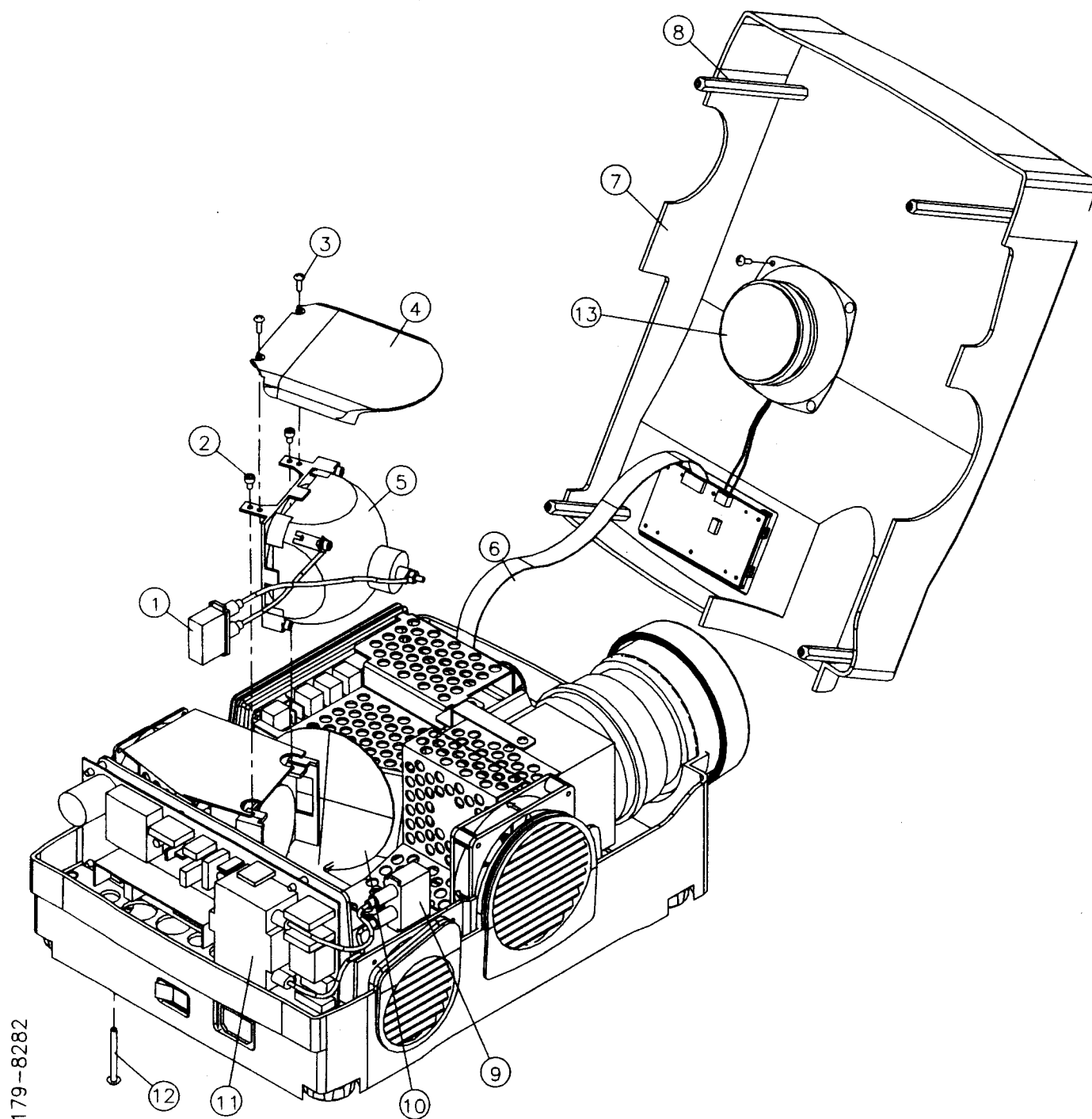
Removal

1. Remove cabinet, top. (RR. 1.1)
2. Remove air grids, two on right side, and one on left side. **(fig. 1 – pos. 8, 9, 17)**
3. Turn the unit without top cabinet upside down. NOTICE: Use extreme caution when turning the unit upside down, making sure not to harm the colour wheel. **(fig. 2 – pos. 10)**
4. Remove four adjustable feet, by unscrewing them totally.
5. Place the unit right side up again.
6. Remove connector plate (RR 1.3) and remove frame surrounding it. **(fig. 1 – pos. 12)**
7. Tilt carrying handle out from the unit.
8. Separate cabinet, bottom from chassis by lifting chassis out of the cabinet in front

Replacement

1. Place main chassis in the bottom cabinet at the back, noticing the power input and the power switch.
2. Slide the chassis carefully down in front of unit.
3. Slide handle back into 'snap-locked' position.
4. Replace four feet, by screwing them back in position.

4 REMOVAL & REPLACEMENT



179-8282

fig.2, lamp placement and cabinet service position.

RR 1.3 CONNECTOR PLATE

Removal

1. Turn unit off, and unplug the unit from power supply.
2. Unplug all connectors.
3. Remove three screws, and two nuts (EVC connector) holding the connector plate.
4. Slide connector plate (**fig. 2 – pos. 10**) carefully out from the connectors.

Replacement

1. Place connector plate in front of connectors.
2. Replace three screws and two nuts. (EVC connector)

2.0 LAMP

RR 2.1 LAMP REPLACEMENT

CAUTION:

To avoid burns, allow the projector to cool for at least 30 minutes before you open the unit.

Removal

1. Remove cabinet, top (RR 1.1)
2. Unplug the lamp connector (**fig. 2 – pos. 1**)

CAUTION: To avoid electrical shock from bulging capacitor, do not touch the lamp electrodes before you have unplugged the lamp module from the lamp driver. For the same reason do not touch any components on the lamp driver PCB

3. Loosen the 2 screws (**fig. 2 – pos. 3**) securing the lamp heat cover (**fig. 2 – pos. 4**) and remove the cover.

CAUTION: Do not remove the lamp heat cover before you have disconnected the lamp connector.

4. Remove the 2 screws (**fig. 2 – pos. 2**) securing the lamp module and lift the lamp module (**fig. 2 – pos. 5**) carefully out. DO NOT TOUCH THE COLOUR WHEEL (**fig. 2 – pos. 10**).

Replacement

1. Carefully install the new lamp module (**fig. 2 – pos. 5**).
2. Install the 2 screws (**fig. 2 – pos. 2**) securing the lamp module.
3. Install the lamp heat cover (**fig. 2 – pos. 4**) and tighten the screws (**fig. 2 – pos. 3**).
4. Reconnect the lamp connector (**fig. 2 – pos. 1**).
5. Replace cabinet, top. (RR 1.1)
6. Connect the power cord to the outlet and switch ON the unit. Be aware of the fact that the ignition sequence may take up to 1 minute before the lamp illuminate.

4 REMOVAL & REPLACEMENT

3.0 ELECTRONIC PARTS

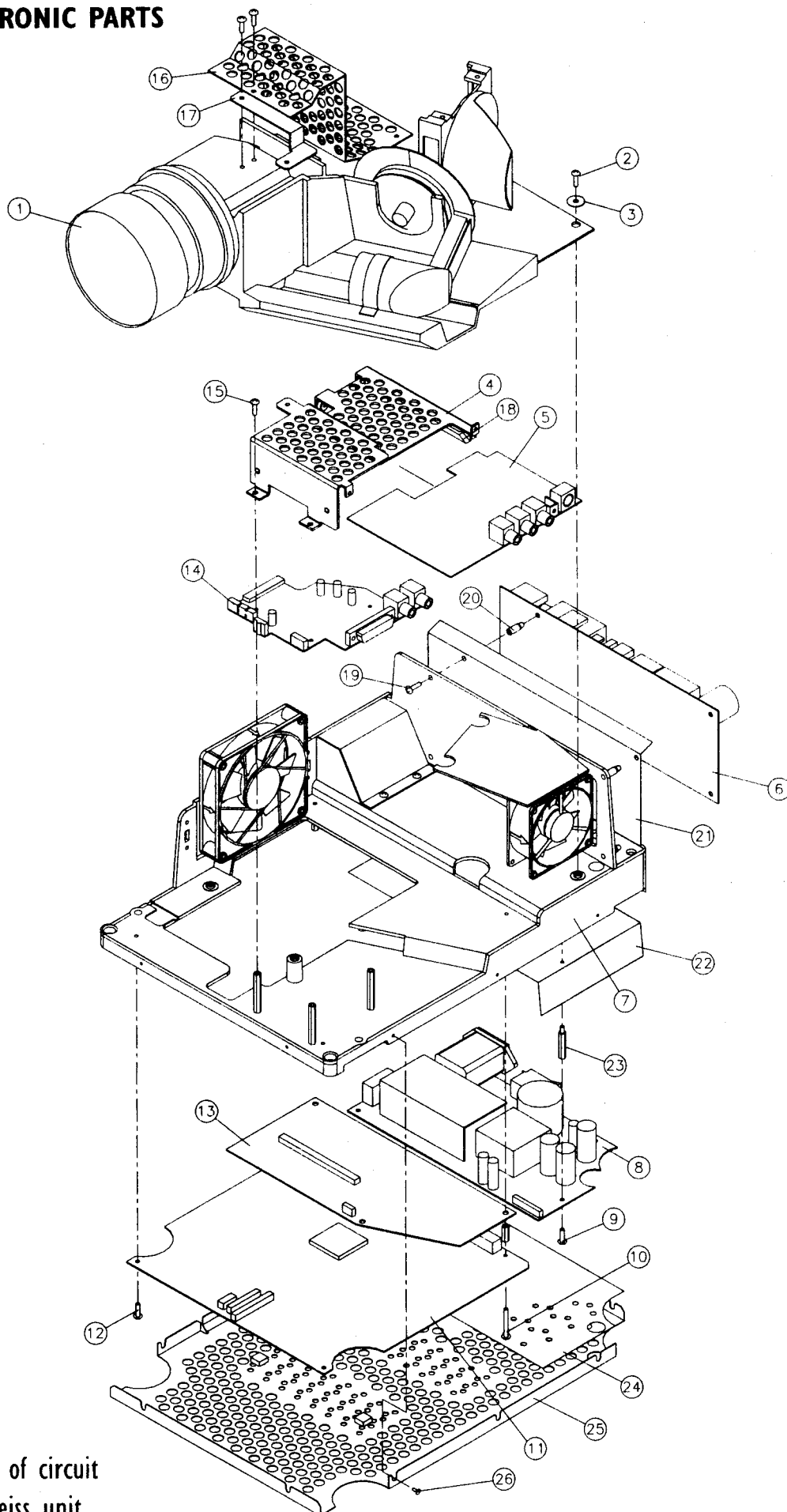


fig.3, location of circuit boards and Zeiss unit.

RR 3.1 FRONT-END POWER SUPPLY

Removal

1. Remove cabinet, top (RR 1.1)
2. Remove cabinet, bottom (RR 1.2)
3. Place unit upside down.
4. Disconnect cables from the lamp driver (2 pcs.) (**fig. 3 – pos. 6**).
5. Unscrew fastening screws, 3 pcs.
6. Unscrew screws fastening power entry module.
7. Lift front-end power supply PCB (**fig. 3 – pos. 8**) out of main chassis.
8. Disconnect flex cable from main board (**fig. 3 – pos. 11**).
9. Remove front-end power supply PCB.

Replacement

1. Connect flex cable from main board, making sure the cable is properly seated in the connector. Snap the cable lock properly back in locked position. Check cable connection at main board side as well.
2. Connect cables going through chassis (**fig. 3 – pos. 7**) to the front-end power supply. (2 pcs.)
3. Replace 3 fastening screws, and 2 screws fastening power entry module.
4. Connect cables to lamp driver PCB (**fig. 3 – pos. 6**). (2 pcs.)
5. Replace cabinet, bottom (RR 1.2)
6. Replace cabinet, top (RR 1.1)

4 REMOVAL & REPLACEMENT

RR 3.2 MAIN BOARD

Removal

1. Remove cabinet, top (RR 1.1)
2. Remove cabinet, bottom (RR 1.2)
3. Place unit upside down.
4. Disconnect flex cable from front-end power supply (**fig. 3 – pos. 8**) by unsnapping lock mechanism.
5. Place unit correct side up.
6. Disconnect 3 cables at front of mainboard, using a small screwdriver to open snaplocks on connectors.
7. Place unit upside down.
8. Unscrew fastening screws, 5 pcs.
9. Carefully lift board at the back, disconnecting it from the Texas formatting board.
(**fig. 3 – pos. 13**).
10. Remove main board.

Replacement

1. Place main board in correct position.
2. Push formatter board connector into position.
3. Replace 5 fastening screws, flat screw under flex cable.
4. Connect flex cable from front-end power supply. (**fig. 3 – pos. 8**).
5. Connect 3 cables in front of main board, using a pair of pliers to insert flex cables.
Make sure the flex cables are seated correctly, and that snap locks are locked.
6. Replace cabinet, bottom (RR 1.2)
7. Replace cabinet, top (RR 1.1)

RR 3.3 TEXAS INSTRUMENTS FORMATTER BOARD

Removal

1. Remove cabinet, top (RR 1.1)
2. Remove cabinet, bottom (RR 1.2)
3. Remove main board (RR 3.2)
4. Remove DMD shielding (**fig. 3 – pos. 16**), by unscrewing 3 fastening screws.
5. Disconnect DMD connector, by carefully using a small screwdriver trough the fan, separating connector from formatter board.
6. Unscrew 3 fastening spacers, securing PCB to main chassis.
7. Tilt board over to the front, and disconnect flex cable from colour wheel !
8. Remove TI formatting board (**fig. 3 – pos. 13**).

Replacement

1. Connect flex cable from colour wheel. Make sure cable is correctly seated and locked.
2. Place TI formatter board in correct position (**fig. 3 – pos. 13**).
3. Replace 3 fastening screws.
4. Using one finger on top of DMD connector, and one below the formatter board, snap connector in place.
5. Replace DMD shielding (**fig. 3 – pos. 16**), using M3-4 screws
6. Replace main board (RR 3.2)
7. Replace cabinet, bottom (RR 1.2)
8. Replace cabinet, top (RR 1.1)

4 REMOVAL & REPLACEMENT

RR 3.4 VIDEO EXTENSION BOARD

Removal

1. Remove connector plate (RR 1.3)
2. Use one screw, and fasten this slightly to the video board, forming a handle.
3. Pull video extension board (**fig. 3 – pos. 5**) out

Replacement

1. Place video extension board in slides.
2. Slide video extension board all the way in.
3. Replace connector plate, and fasten 5 screws (3+2 EVC)

RR 3.5 ANALOG BOARD

Removal

1. Remove cabinet, top (RR 1.1)
2. Remove connector plate (RR 1.3) and frame.
3. Slide out video extension board, (**fig. 3 – pos. 5**) if mounted.
4. Carefully remove flex cables glued to metal housing (**fig. 3 – pos. 4**).
5. Unscrew 4 screws fastening metal housing, and tilt this up and place it upside down on lens assembly.
6. Disconnect:

Fan cables	(3 pcs)
Touch panel flex	(1 pc.)
Colour wheel cable	(1 pc.)
Main board flex	(1 pc.)
7. Unscrew final fastening screw.
8. Remove analog board.

Replacement

1. Connect all cables previously removed, making sure flex cables are correctly seated and locked in position.
2. Fasten single fastening screw.
3. Replace metal housing.
4. Fasten four fastening screws.
5. Replace connector plate frame.
6. Replace video extension board.
7. Replace connector plate (RR. 1.3)
8. Replace cabinet, top (RR. 1.1.)

4 REMOVAL & REPLACEMENT

RR 3.6 LAMP DRIVER BOARD.

CAUTION: Hazardous voltages present at driver output (25kV) during operation. Resident voltage present at heatsinks and components even after power off. Use caution when handling lamp driver PCB.

Removal

1. Remove cabinet, top (RR 1.1)
2. Disconnect power connection from lamp driver PCB, 2 connectors.
3. Disconnect lamp.
4. Unscrew 4 fastning screws securing lamp driver PCB to main chassis.
5. Remove lamp driver PCB.

Replacement

1. Fasten lamp driver PCB to main chassis with four screws, securing it to plastic spacers.
2. Connect powercables, 2 connectors.
3. Connect lamp.
4. Replace cabinet, top (RR 1.1)

RR 3.7 TOUCH PANEL

Removal

1. Remove cabinet, top (RR 1.1)
2. Disconnect flex cable from touch panel PCB.
3. Disconnect loudspeaker from touch panel PCB.
4. Snap touch panel assy. out of cabinet, top.
5. Unscrew 6 screws assembling touch panel, silicone and PCB.

Replacement

1. Assemble touch panel, silicone and PCB.
2. Replace 6 screws fastening touch panel assy.
3. Set correct dip switch setting according to note following new touch panel.
4. Snap touch panel assy. back into position in cabinet, top.
5. Mount loudspeaker cable, and flex cable from analog board, making sure flex cable is correctly seated and locked into position.

4.0 OTHER PARTS

RR 4.1 ZEISS OPTICAL ENGINE

Removal

1. Remove cabinet, top (RR 1.1)
2. Remove cabinet, bottom (RR 1.2)
3. Remove analog board (**fig. 3 – pos. 14**) (RR 3.5)
4. Remove lamp driver PCB (**fig. 3 – pos. 6**) (RR 3.6)
5. Remove left fan and bracket by unscrewing two fastning screws located behind lamp driver.
6. Remove DMD shielding, by unscrewing 3 screws.
7. Disconnect color wheel cable going trough main chassis to TI formatter board.
8. Disconnect DMD connector, by carefully using a small screwdriver trough the fan, separating connector from formatter board.
9. Unscrew 3 screws fastening Zeiss engine to main chassis.
10. Loosen fan cables from lens assy.
11. Carefully separate Zeiss unit (**fig. 3 – pos. 1**) from main chassis.
12. Unscrew 2 spacer nuts holding analog board to Zeiss unit.

Replacement

1. Mount 2 spacer nuts for holding analog board.
2. Carefully slide Zeiss unit into position.
3. Fasten 3 screws, securing Zeiss unit to main chassis.
4. Connect colour wheel cable to TI formatter board, using a pair of small pliers.
5. Connect DMD connector, using a finger to press connector securely in position.
6. Replace DMD shielding using 3 M3-4 screws.
7. Replace analog board (RR 3.5)
8. Check all cables and flex cables.
9. Replace cabinet, bottom (RR 1.2)
10. Replace cabinet, top (RR 1.1)

4 REMOVAL & REPLACEMENT

RR 4.2 FAN, LARGE RIGHT

Removal

1. Remove Zeiss optical engine (RR 4.1)
2. Unscrew 2 screws fastening fan to main chassis.
3. Remove fan.

Replacement

4. Fasten fan with 2 screws.
5. Replace Zeiss optical engine. (RR 4.1)
6. Replace top/bottom cabinet (RR1.1 / 1.2)

RR 4.3 FAN, SMALL RIGHT

Removal

1. Remove Zeiss optical engine (RR 4.1)
2. Remove airguide.
3. Remove front-end power supply (RR 3.1)
4. Unscrew 3 screws fastening fan to main chassis.
5. Remove fan.

Replacement

1. Fasten fan with 3 screws.
2. Replace airguide, NB: using two M3-4 screws.
3. Replace Zeiss optical engine. (RR 4.1)
4. Replace front-end power supply (RR 3.1)
5. Replace top/bottom cabinet (RR1.1 / 1.2)

RR 4.4 FAN, SMALL LEFT

Removal

1. Unscrew 2 screws fastening fan.
2. Disconnect fan from extension cable.
3. Remove fan.

Replacement

1. Fasten fan with 2 screws.
2. Connect fan to extension cable.
3. Replace front-end power supply (RR 3.1)
4. Replace top/bottom cabinet (RRI.1 / 1.2)

RR 4.5 LOUDSPEAKER

Removal

1. Remove cabinet, top (RR 1.1)
2. Disconnect loudspeaker cable from touch panel PCB
3. Unscrew 4 screws fastening loudspeaker to cabinet, top.
4. Remove loudspeaker

Replacement

1. Fasten loudspeaker with 4 screws to cabinet, top.
2. Connect loudspeaker cable to touch panel PCB
3. Replace cabinet, top. (RR 1.1)